

HIGH SCHOOL SCIENCE LABS

Fridays, September 13-December 13 (no class October 11 and 18, or November 29; 11 weeks)

9:30am-11:30am

Ages 14+

Students learn laboratory techniques and perform hands-on science experiments to supplement their high school physical science, chemistry and biology curricula. A brief review of relevant material starts each lab, followed by a lab period which includes lab preparation, experimentation and clean-up. Students work semi-independently to conduct each lab and complete reports for each investigation. All lab costs are included in registration fee. Course enrollment is limited to 12 students. Descriptions for individual labs can be found here.

Instructor: Tonya Shearer, PhD

Location: STEM Lab (suite 21)

Course fee: \$300 OR \$30/lab

10% off early registration discount through July 31

10% off sibling discount available beginning August 1

LAB SCHEDULE:

Compounds, Reactions, and Stoichiometry – Friday, September 13

We review the organization of periodic table of elements, determine the atomic mass of compounds, and calculate the reactants and products in chemical reactions based on the law of conservation of matter.

Light Lab – Friday, September 20

Students investigate the electromagnetic spectrum as we explore the physics and chemistry of light. We also compare chemiluminescence, bioluminescence, phosphorescence and fluorescence to understand the emission of each light source.

Measurement and Molar Calculations – Friday, September 27

In this lab, we master the proper use of scientific measuring tools, including graduated cylinders, micropipettes, calipers and balances, review our understanding of metric conversions, and determine molar calculations necessary to make specific solutions.

Bacterial Investigations – Friday, October 4

We turn our attention to microbes in this lab as we classify bacteria by cell and colony characteristics, learn protocols for bacterial culturing and Gram staining, and design a proper antimicrobial experiment.

Flower and Seed Dissection Lab – Friday, October 25

Our attention turns to botany this week as we study the anatomical features of flowers and seeds, classification of fruits, and plant adaptations that increase pollination and dispersal.

Smoke and Fire Science – Friday, November 1

In lab today, students study combustion and the chemical reaction that occurs when we light a match, investigate why things burn and what smoke is made of, and learn what causes fireworks to be different colors.

Acid and Base Lab – Friday, November 8

Students study the role of hydrogen in measuring pH of liquids, learn about and experiment with the neutralization process, and test pH of different liquids using various indicators.

Water Chemistry Lab – Friday, November 15

We analyze the chemical make-up of water from various sources, including water from a pond, a fresh water tank and a salt water tank, to investigate nutrient cycles, biological filters, and sources of nutrient pollutants.

Crystallization – Friday, November 22

This week we study the process of crystallization, observe how molecules arrange themselves as they precipitate out of a liquid, and experiment with the effects of temperature on the formation of crystals.

Polymer Lab – Friday, December 6

In this Materials Science Lab, we investigate the properties of four polymers and conduct experiments to study their unique chemical structure and everyday uses.

Soldering Circuits – Friday, December 13

Students explore simple and complex circuits as we test our skills at soldering circuit boards, learn about electrical components and mechanical parts and build their own mini-robot car.